

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460**



**OFFICE OF CHEMICAL SAFETY AND  
POLLUTION PREVENTION**

**MEMORANDUM**

**Date:** 09/07/2016

**SUBJECT:** Cyantraniliprole: Chronic Aggregate Dietary (Food plus Drinking Water) Exposure and Risk Assessments in Support of a Section 3 Registration Action for Uses on Root Vegetables (except Sugar Beet) (Crop Subgroup 1B), Leaves of Root and Tuber Vegetables (Crop Group 2), Legume Vegetables (except Soybean) (Crop Group 6), Leaves of Legume Vegetables (Crop Group 7 except Soybean), Peanuts, and Strawberries. Tolerance Requests without U.S. Registration for Artichokes, Coffee Bean (Green), Grapes (Wine), Low Growing Berries (except Strawberries) (Crop Subgroup 13-07H), Olives, Pomegranate, and Tea (Dried). Amended Tolerance Requests for Cucurbit Vegetables due to New Use Pattern and Amended Uses for Tomatoes and Peppers.

**PC Code:** 090098

**Decision No.:** 488992

**Petition No.:** 4F8258

**Risk Assessment Type:** Dietary

**TXR No.:** NA

**MRID No.:** NA

**DP Barcode:** D435590

**Registration Nos.:** 352-856, 352-857, 352-858,  
352-859, 352-860

**Regulatory Action:** Section 3 Registration

**Case No.:** NA

**CAS No.:** 736994-63-1

**40 CFR:** §180.672

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**TO:** Jackie Herrick (Marchese)/Mark Suarez, RM 07  
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## **I. Executive Summary**

A chronic aggregate dietary (food and drinking water) exposure and risk assessment was conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID) Version 3.16. This software uses 2003-2008 food consumption data from the U.S. Department of Agriculture's (USDA's) National Health and Nutrition Examination Survey, What We Eat in America, (NHANES/WWEIA). The analyses were conducted in support of a human health risk assessment for the proposed Section 3 requests on numerous commodities, including corn commodities (field, sweet, pop), root vegetables (except sugar beet) (crop subgroup 1B), leaves of root and tuber vegetables, legume vegetables, soybeans, leaves of legume vegetables, peanuts, strawberries, and an amended tolerance request for cucurbit vegetables due to new use pattern (greenhouse). In addition, analyses were conducted for tolerance without US registration requests for artichokes, coffee bean (green), grapes (wine), low growing berries (except strawberries) (crop subgroup 13-07H), olives, pomegranate, and tea (dried). This memorandum was reviewed by two peer reviewers of the DESAC, per DESAC SOP 2012.1.

### Acute and Cancer Dietary Exposure

No acute dietary toxicity endpoint could be identified based on the toxicology data currently available for cyantraniliprole; therefore, an acute assessment was not performed.

The Cancer Assessment Review Committee (CARC) classified cyantraniliprole as "not likely to be carcinogenic to humans"; therefore, a cancer assessment was not performed.

### Chronic Dietary Exposure Results and Characterization

A refined chronic (food and drinking water) dietary assessment was conducted assuming average field trial residues for all crops (except crop subgroup 1A), percent crop treated (%CT) where available, and percent crop treated for new uses (PCTn) data. In addition, the estimated percentage of imported grapes was incorporated into the assessment. The chronic assessment incorporated empirical processing factors, if available, or DEEM version 7.81 default processing factors, as appropriate. The estimated drinking water concentration (EDWC) was incorporated directly into the dietary assessment using the 1-in-10 year annual mean of 64 µg/L from ground water estimates.

The results of this chronic analysis indicate that chronic dietary (food and drinking water) exposure and risk does not exceed HED's level of concern for the U.S. population and all population subgroups. The results of the DEEM-FCID analysis indicate that the risks are 34% of the chronic population-adjusted dose (cPAD) for the general U.S. population and 98% of the cPAD for children (1-2 years old), the most highly exposed subgroup.

## Introduction

Dietary risk assessment incorporates both exposure and toxicity for any given pesticide. For acute and chronic assessments, the risk is expressed as a percentage of a maximum acceptable dose (i.e., the dose which HED has concluded will result in no unreasonable adverse health effects). This dose is referred to as the population-adjusted dose (PAD). The PAD is equivalent to point of departure (POD), no observed adverse effect level (NOAEL), lowest observed adverse effect level (LOAEL) divided by the required uncertainty or safety factors.

For non-cancer chronic exposures, HED is concerned when estimated dietary risk exceeds 100% of the cPAD. References that discuss chronic risk assessments in more detail are available on the EPA/pesticides web site: "Available Information on Assessing Exposure from Pesticides, A User's Guide," 21-JUN-2000, web link: <https://www.regulations.gov/document?D=EPA-HQ-OPP-2007-0780-0001> or see SOP 99.6 (20-AUG-1999).

The most recent (first) HED dietary risk assessment for cyantraniliprole was conducted by M. Negussie (DP# D407963, 01/29/2013).

## II. Residue Information

Cyantraniliprole is a second generation ryanodine receptor insecticide. The crops registered in the U.S. include berries, citrus, cotton, oilseeds, pome fruits, stone fruits, tree nuts, and various vegetables [40 CFR § 180.672].

The residue of concern for tolerance enforcement in plants and livestock is the parent compound. The residues of concern for risk assessment in processed commodities are the parent compound and the metabolite IN-J9Z38. The residues of concern for risk assessment in ruminants are the parent compound, IN-N7B69, IN-MLA-84, IN-MYX98, and IN-J9Z38 (ROCKS D404411, July 24, 2012). Refer to (DP# D407961, S. Funk, 01/25/2013) for names and structures.

The residues of concern for drinking water assessment have been revised to include IN-JCZ38, IN-J9Z38, IN-K5A77, IN-NXX69, IN-QKV54 and IN-RNU71, in addition to the parent compound cyantraniliprole. IN-NXX69, IN-QKV54 and IN-RNU71 are all photolytic degradates and do not contribute to the ground water concentrations since photolysis is not an input into the ground water model.

The HED removed four major degradates from the residues of concern (ROC) expression since DuPont has provided information to show these degradates (IN-JSE76, IN-K5A79, IN-PLT97, IN-K5A78) are much less toxic than the parent compound, based primarily on physical-chemical properties and comparison of the results of repeated dose studies between cyantraniliprole and representative degradates (USEPA 2016c; DP 429265).

The USDA Pesticide Data Program (PDP) monitored pesticide residues in catfish in 2008, 2009, and 2010, and in salmon in 2013 and 2014. However, cyantraniliprole was not registered until about 2013 and PDP did not look for residues of cyantraniliprole in salmon in 2014; therefore, residues in fish were not included in the assessment. In general, pesticide residues would not be expected to be found in fish unless the pesticide bio-accumulates or has an aquatic use. To determine whether or not residues are present in fish, HED now routinely checks PDP monitoring data regardless of the pesticide's uses and physicochemical properties.

#### Residue Data used for Chronic Assessments:

HED used average field trial residues for all crops (except crop subgroup 1A), % CT where available, PCTn for some new uses, and % of grapes that are imported. The chronic assessment incorporated empirical processing factors, if available, or DEEM version 7.81 default processing factors, as appropriate. Empirical processing factors were used for potato flakes and chips, tomatoes (paste, puree, dried, and juice), orange juice, apple juice, cottonseed oil, citrus oil, and dried plums. Empirical processing factor for pear juice was translated from apple juice. The processing factors for these commodities were set at 1 because the residue input values included combined residues of the parent and the metabolite with relevant processing factors. DEEM default processing factors were used for dried beef (1.92), onion-dehydrated or dried (9.0), grapefruit juice (2.1), lemon juice (2.0), tangerine juice (2.3), dried apple (8.0), cranberry juice (1.1), cherry juice (1.5), dry pear (6.25), dry apricot (6.0), dry peach (7.0), and plum juice (1.4), dried coconut (2.1), and peanut butter (1.89). Crop field trial data depicting residues in/on the peel of citrus fruits (lemon peel and orange peel) was available; these values were included in the assessment. Cyantraniliprole residues were found to concentrate in wine grapes (2x) following processing of mature grapes with quantifiable residues. The proposed tolerance is for wine import only; therefore, no tolerance is recommended for raisins and grape juice. The EDWC was incorporated directly into the dietary assessment using the 1-in-10 year annual mean of 64 µg/L. Average field trial values were translated from the representative commodities to the other commodities according to HED DESAC SOP 2000.1.

#### Processed Commodities:

Average cyantraniliprole and the metabolite (IN-J9Z38) residues in the raw agricultural commodity (RAC) were multiplied by relevant processing factors to obtain the estimate of residues in the food as consumed. The result is combined and the total residue is used in the dietary assessment.

#### Meat, Milk, Poultry and Eggs:

Anticipated residues (parent plus metabolites of concern) were calculated for milk, and the ruminant fat, kidney, liver, meat, and meat byproducts. For all ruminant commodities, anticipated residues were calculated based on the dietary burden of dairy cattle. Anticipated residue/tolerances for swine and poultry are not needed for this

petition. Based on the ROCKS (D404411, July 24, 2012), metabolites (IN-N7B69, IN-MLA-84, IN-MYX98, and IN-J9Z38) that are relevant in each of the matrices were included for risk assessment purposes. Refer to Attachment 4 for the calculation.

### Summary of Dietary Exposure Input Data

Average field trial residues for all crops (except crop subgroup 1A), % CT where available, PCTn for some new uses, and % of grapes that are imported were assumed. Default DEEM (ver. 7.81) and empirical processing factors were used as appropriate (DP# D407961, S. Funk, 01/25/2013). Table 1 presents the residue values for the registered/proposed uses. The complete details of HED recommendations are presented in the summary document (DP# D435591, M. Negussie, 08/15/2016) and Attachment 4 of this memorandum which provides the estimate of the anticipated residues.

<b>Table 1. Residue Data Used for Cyantraniliprole Chronic Analyses.</b>					
Matrix	Tolerance Level (ppm)	Highest Average Field Trial Residue (ppm)	Average Field Trial Residue (ppm)	Anticipated Residue (AR) <sub>1,2</sub>	Experimental Processing Factors
Root and tuber vegetables (Crop subgroup 1C)	0.15	0.110	0.024		
<ul style="list-style-type: none"> <li>Potato flakes and chips</li> </ul>			P = 0.024 M = 0.011	0.0254	Cyantraniliprole (P) = 0.6 flakes, chips  IN-J9Z38 (M) = 1 flakes, chips
Crop subgroup 1A (Inadvertent Residue)	0.02				
Onion, bulb Crop Subgroup 3-07A	0.04	0.027	0.015		
Onion, green Crop Subgroup 3-07B	8.0	4.1	1.60		
Crop Group 4	20				
<ul style="list-style-type: none"> <li>Head Lettuce</li> </ul>	5	2.7	0.955		
<ul style="list-style-type: none"> <li>Leaf Lettuce</li> </ul>	15	6.8	4.43		
<ul style="list-style-type: none"> <li>Celery</li> </ul>	15	9.1	2.783		
<ul style="list-style-type: none"> <li>Spinach</li> </ul>	20	13.0	6.243		
Brassica, head and stem Crop Subgroup 5A	3.0				
<ul style="list-style-type: none"> <li>Head Cabbage</li> </ul>	2.0	0.95	0.556		
<ul style="list-style-type: none"> <li>Broccoli</li> </ul>	3.0	1.1	0.743		
Brassica, leafy greens Crop Subgroup 5B					
<ul style="list-style-type: none"> <li>Mustard Greens</li> </ul>	30	19	7.391		
Fruiting Vegetables Crop Group 8	2.0				
<ul style="list-style-type: none"> <li>Tomato</li> </ul>	1.0	0.620	0.239		P = 3.5 Sundried; 0.09 Juice; 0.60 Paste; 0.19 Puree
<ul style="list-style-type: none"> <li>Tomato, sundried</li> </ul>			P = 0.239	0.864	

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Matrix	Tolerance Level (ppm)	Highest Average Field Trial Residue (ppm)	Average Field Trial Residue (ppm)	Anticipated Residue (AR) <sup>1,2</sup>	Experimental Processing Factors
• Tomato, juice			M = 0.010	0.032	M = 2.7 Dried; 1 Juice; 4.2 Paste; 1.3 Puree
• Tomato, paste				0.185	
• Tomato, puree				0.058	
• Bell Pepper	0.5	0.280	0.127		
• Non-bell Pepper	2.0	1.0	0.343		
Cucurbit Vegetables Crop Group 9	0.4				
• Cucumber	0.3	0.160	0.155		
• Muskmelon	0.4	0.185	0.110		
• Squash	0.2	0.110	0.061		
Citrus Fruits Crop Group 10	0.7				
• Grapefruit	0.5	0.310	0.157		
• Lemon	0.6	0.300	0.198		
• Lemon-peel	N/A	0.625	P = 0.413 M = 0.010	0.423	
• Orange	0.7	0.390	0.209		P = 0.08 Juice; 6.2 Oil
• Orange Juice			P = 0.209	0.027	M = 1 Juice; 7.5 Oil
• Citrus Oil	2.4		M = 0.010	1.371	
• Orange-peel	N/A	0.885	P = 0.463 M = 0.010	0.473	Residues from crop field trial data
Pome Fruits Crop Group 11	1.5				
• Apple	0.5	0.310	0.168		P = 0.32 Juice; 1.4 Applesauce
• Apple, juice			P = 0.168 M = 0.010	0.064	M = 1 Juice; 35 Applesauce
• Apple, sauce				0.585	
• Pear	1.5	0.580	0.278		
Stone Fruits Crop Group 12					
• Cherry subgroup 12-12A	6.0	3.800	1.179		
• Peach subgroup 12-12B	1.5	0.960	0.386		
• Plum subgroup 12-12C	0.5	0.280	P = 0.104 M = 0.010		
• Plum, prune, dried				0.17	P = 1.5 Dried M = 1.4 Dried
Berries and small fruits, bushberries (crop subgroup 13-07B)	4	2.0	0.888		
Tree Nuts Crop Group 14-12	0.04				
• Almond	0.04	0.023	0.013		
• Pecan	0.01	0.010	0.010		
Oilseeds Crop group 20	1.5				

<b>Table 1. Residue Data Used for Cyantraniliprole Chronic Analyses.</b>					
Matrix	Tolerance Level (ppm)	Highest Average Field Trial Residue (ppm)	Average Field Trial Residue (ppm)	Anticipated Residue (AR) <sup>1,2</sup>	Experimental Processing Factors
• Cotton, Seed	1.5	0.990	P = 0.212 M = 0.010	0.0238	P = 0.006 Refined oil M = 1.5 Refined oil
• Cotton seed, oil				0.016	
• Canola	0.8	0.61	0.157		
• Sunflower Seed	0.5	0.320	0.10		
<b><i>Proposed Uses</i></b>					
Crop Subgroup 1B	0.40				
• Carrot			0.03		
• Radish			0.104		
Crop Group 2	40				
• Sugar beet tops			8.025		
• Turnip tops			4.983		
Crop Subgroup 6A	2.0				
• Snap bean			0.322		
• Snow pea			0.595		
Crop Subgroup 6B	0.20				
• Lima bean			0.017		
• Garden pea			0.064		
Crop Subgroup 6C	1.0				
• Dried bean			0.034		
• Dried pea			0.134		
Soybean	0.40		0.066		
Crop group 9 (Established)	0.70				
• Cucumber (green house)			0.155		
Crop Subgroup 13-07H					
• Cranberry	0.08		0.022		
Crop group 20B (Established)	0.8				
• Sunflower (new use pattern)	1.5		0.142		
Peanut	0.01		0.01		
Strawberry	0.5		0.329		
<b><i>Section 3 Registration without U.S Tolerance</i></b>					
• Artichoke	0.1		0.031		
• Coffee	0.05		0.015		
• Wine grapes	2.0		0.291		
• Olive	1.5		0.390		
• Olive oil	2.0				
• Pomegranate	0.01		0.01		
• Rice	0.015		0.01		
• Tea	60		13.04		
<b><i>Livestock Tolerances/Anticipated Residues</i></b>					
Milk	0.20			0.12	
Fat (cattle, goat, and sheep)	0.10			0.01	

<b>Table 1. Residue Data Used for Cyantraniliprole Chronic Analyses.</b>					
Matrix	Tolerance Level (ppm)	Highest Average Field Trial Residue (ppm)	Average Field Trial Residue (ppm)	Anticipated Residue (AR) <sup>1,2</sup>	Experimental Processing Factors
Meat (cattle, goat, sheep, and horse)	0.06			0.01	
Kidney (cattle, goat, and sheep)	None			0.01	
Liver (cattle, goat, and sheep)	0.40			0.01	
Meat byproducts (cattle, goat, and sheep)	0.40			0.01	

<sup>1</sup> AR for processed commodities AR = Cyantraniliprole (Average Residue) X Median Processing Factor (PF) + IN-J9Z38 (Average Residue) X Median PF; Residue of concern for processed commodities are parent and the metabolite (IN-J9Z38).

### III. Percent Crop Treated Information

The following average percent crop treated estimates (D432594, D. Atwood, 09/01/2016), were used in the chronic dietary risk assessment for the following crops that are currently registered for cyantraniliprole: citrus: oranges 62%, grapefruit 87%, and lemons 46%; pome fruit: apples 61% and pears 76%; stone fruits: apricots 53%, cherries 48%, peaches 41%, and plums/prunes 59%; tree nuts: almonds 72%, hazelnuts 65%, pecans 22%, pistachios 49%, and walnuts 53%; bushberries (subgroup 13-07B): blueberries 45%; fruiting vegetables: peppers 45% and tomatoes 54%; cucurbits: cantaloupes 50%, cucumbers 23%, pumpkins 18%, squash 24%, and watermelons 29%; leafy vegetables: celery 70%, lettuce 78%, and spinach 53%; *Brassica* (cole) leafy vegetables: broccoli 81%, cabbage 50%, and cauliflower 83%; onion 58%; potato 50%; oilseeds: canola 15% and sunflower 35%; and corn 56%.

The following estimated percent crop treated for proposed new uses were used in the chronic dietary risk assessment (D432594, D. Atwood, 09/01/2016): cotton 41%; peanuts 41%; carrots 23%; soybeans 21%; strawberries 59%; vegetable crop group 7: dry beans/peas 6%, soybeans 21%, beans (snap, bush, etc.) 49%, and peas fresh/green/sweet) 38%; vegetable crop group 2: sugar beets 40%; vegetable crop group 6A: soybeans 21%, beans (snap, bush, etc., string) 49%; peas fresh/green/sweet) 38%; vegetable crop group 6C: dried bean and peas 6%.

For the imported grapes (wine grapes) 50% import estimate were used in the chronic dietary risk assessment (D433492, D. Atwood, 09/07/2016).

### IV. Drinking Water Data

The drinking water residues used in the dietary risk assessment were provided by EFED (D433365, C. Koper, 06/12/2016) and incorporated directly into this dietary assessment. Water residues were incorporated in the DEEM-FCID into the food categories “water, direct, all sources” and “water, indirect, all sources.” EFED is providing new estimated EDWCs based on the re-evaluation of various crops that are grown over two seasons per

year. The recommended EDWCs for ground water include the acute concentration of 70 µg/L and post breakthrough average (chronic) concentration of 64 µg/L.

For surface water, the FIRST (FQPA Index Reservoir Screening Tool) Version 1.1.1 model was used to estimate drinking water concentrations. The EDWCs for surface water [acute = 43 µg/L; chronic = 24 µg/L] from the former drinking water assessment (DP403747, C. Koper, 11/21/2012) remain recommended for this assessment. The model and its description are available at the EPA internet site:

<http://www.epa.gov/oppefed1/models/water/>.

Based on Pesticide in Water Calculator (PWC) modeling the ground water EDWCs for various uses are presented in Table 2. The model (PWC; version 1.52) and its description are available at: <https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/models-pesticide-risk-assessment>). The Pesticide in Water Calculator, previously known as the Surface Water Concentration Calculator (SWCC), is not a new model but an interface that was used in this assessment for its ground water estimation capabilities for parent and daughter compound relationships that were not available with the Pesticide Root Zone Model- Ground Water (PRZM-GW) model.

<b>Table 2. Cyantraniliprole Bounding EDWCs in Ground Water following Direct IN-JCZ38 Degradate Conversion.</b>					
		Upper-Bound EDWC Formation Decline Half-Lives <sup>1</sup>		Lower-Bound EDWC Laboratory Half-Lives <sup>2</sup>	
Application Rate and Frequency	Scenario	Acute (µg/L)	Chronic (µg/L)	Acute (µg/L)	Chronic (µg/L)
<u>Various Crops:</u> 3 app. x 0.133 lbs a.i./acre x 2 seasons (83% conversion)	FL Citrus	47	42	2.0	1.9
	FL Potato	1	1	3.1x10 <sup>-4</sup>	1.2x10 <sup>-4</sup>
	GA Peanut	12	11	0.19	0.14
	NC Cotton	29	25	0.18	0.14
	Delmarva Sands	29	27	0.28	0.20
	WI Corn	<b>70</b>	<b>64</b>	2.5	2.1
<sup>1</sup> Upper-bound EDWC estimate generated by using the 90 <sup>th</sup> percentile around the mean half-life (151 days) generated using the FD method for five available soils (246 days, 18 days, 115 days, 11 days, 19 days) for the aerobic soil metabolism half-life input. <sup>2</sup> Lower-bound EDWC estimate generated by using the 90 <sup>th</sup> percentile around the mean half-life (25 days) from laboratory studies on the degradates for five available soils (24.7 days, 9.4 days, 19.5 days, 6.04 days, 30.3 days) for the aerobic soil metabolism half-life input. Recommended EDWCs in <b>bold</b> font.					

## V. DEEM-FCID™ Program and Consumption Information

Cyantraniliprole chronic dietary exposure assessment was conducted using the DEEM-FCID, Version 3.16, which incorporates 2003-2008 consumption data from USDA's NHANES/WWEIA. The data are based on the reported consumption of more than 20,000 individuals over two non-consecutive survey days. Foods "as consumed" (e.g., apple pie) are linked to EPA-defined food commodities (e.g., apples, peeled fruit - cooked; fresh or N/S; baked; or wheat flour - cooked; fresh or N/S, baked) using publicly available recipe translation files developed jointly by USDA/ARS and EPA. For chronic

exposure assessment, consumption data are averaged for the entire U.S. population and within population subgroups. However, for acute exposure assessment, consumption data are retained as individual consumption events. Based on analysis of the 2003-2008 WWEIA consumption data, which took into account dietary patterns and survey respondents, HED concluded that it is most appropriate to report risk for the following population subgroups: the general U.S. population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, adults 20-49, females 13-49, and adults 50-99 years old.

For chronic dietary exposure assessment, an estimate of the residue level in each food or food-form (e.g., orange or orange juice) on the food commodity residue list is multiplied by the average daily consumption estimate for that food/food form to produce a residue intake estimate. The resulting residue intake estimate for each food/food form is summed with the residue intake estimates for all other food/food forms on the commodity residue list to arrive at the total average estimated exposure. Exposure is expressed in mg/kg body weight/day and as a percent of the cPAD. This procedure is performed for each population subgroup.

## VI. Toxicological Information

No acute hazard attributable to a single dose was identified; therefore, an acute dietary endpoint was not selected for quantitative risk assessment.

Based on the weight of evidence of the available scientific data, and in accordance with EPA's *Final Guidelines for Carcinogen Risk Assessment* (March 2005), cyantraniliprole may be classified as "Not Likely to Be Carcinogenic to Humans."

The toxicity endpoints pertinent for human risk assessment are summarized in Table 3.

Table 3. Summary of Toxicological Doses and Endpoints for cyantraniliprole for Use in Dietary Human Health Risk Assessments.				
Exposure/ Scenario	Point of Departure	Uncertainty /FQPA Safety Factors	RfD, PAD, Level of Concern for Risk Assessment	Study and Toxicological Effects
Acute Dietary (General Population, including Infants and Children and Females 13-49 years of age)	No effect attributed to a single dose was identified in the toxicology database.			

**Table 3. Summary of Toxicological Doses and Endpoints for cyantraniliprole for Use in Dietary Human Health Risk Assessments.**

Exposure/ Scenario	Point of Departure	Uncertainty /FQPA Safety Factors	RfD, PAD, Level of Concern for Risk Assessment	Study and Toxicological Effects
Chronic Dietary (All Populations)	NOAEL = 1 mg/kg/day	UF <sub>A</sub> = 10x UF <sub>H</sub> = 10x FQPA SF = 1x	cRfD = 0.01 mg/kg/day cPAD = 0.01 mg/kg/day	<b>1-year oral study in dogs</b> LOAEL = 6 mg/kg/day based on effects indicative of liver toxicity (increased liver weights and alkaline phosphatase activity, and significant decreases in albumin level.
Cancer (oral, dermal, inhalation)	Classification: "Not likely to be Carcinogenic to Humans" based on weight of evidence of data: No treatment-related increase in tumors incidence was demonstrated in rat and mouse carcinogenicity studies. No mutagenic concern was reported in the mutagenicity studies.			

Point of Departure (POD) = A data point or an estimated point that is derived from observed dose-response data and used to mark the beginning of extrapolation to determine risk associated with lower environmentally relevant human exposures. NOAEL = no observed adverse effect level. LOAEL = lowest observed adverse effect level. UF = uncertainty factor. UF<sub>A</sub> = extrapolation from animal to human (interspecies). UF<sub>H</sub> = potential variation in sensitivity among members of the human population (intraspecies). FQPA SF = FQPA Safety Factor. PAD = population adjusted dose (c = chronic). RfD = reference dose. LOC = level of concern. HED = human equivalent dose. HEC = human equivalent concentration.

## VII. Results/Discussion

As stated above, for chronic assessments, HED is concerned when dietary risk exceeds 100% of the PAD. The DEEM-FCID analyses estimate the dietary exposure of the U.S. population and various population subgroups. The results reported in Table 4 are for the general U.S. population, all infants (<1-year-old), children 1-2, children 3-5, children 6-12, youth 13-19, females 13-49, adults 20-49, and adults 50-99 years old.

### Results of Chronic Dietary (Food and Drinking Water) Exposure Analysis

For this chronic assessment, the U.S. population and all population subgroups have risk estimates that are below the Agency's level of concern. The highest exposure and risk estimates were for the 'children 1-2 years' population subgroup. The exposure for food and water was 0.009776 mg/kg/day, which utilized 98% of the cPAD. The results of the chronic dietary analyses (food plus drinking water) are reported in Table 4 below.

<b>Table 4. Result of Chronic Dietary Exposure and Risk Estimates for Cyantraniliprole.</b>			
Population Subgroup	cPAD, mg/kg/day	Chronic Estimates (Food and Drinking Water)	
		Exposure, mg/kg/day	Risk, % cPAD
U.S. Population	0.01	0.003423	34
All infants		0.006685	67
<b>Children 1-2 yrs</b>		<b>0.009776</b>	<b>98</b>
Children 3-5 yrs		0.006525	65
Children 6-12 yrs		0.003898	39
Youth 13-19 yrs		0.002455	24
Adults 20-49 yrs		0.002917	29
Adults 50-99 yrs		0.003126	31
Females 13-49 yrs		0.002996	30

The population subgroup with the highest estimated exposure/risk is bolded.

## VIII. Characterization of Inputs/Outputs

The dietary exposure and risk estimates are refined since they assume average residues for all crops, %CT where available, PCTn for some crops, and include empirical processing factors. Additional refinements may be implemented such as the incorporation of additional %CT data, inclusion of additional empirical processing factors, and PDP data. HED concludes that the chronic dietary exposure and risk estimates are not underestimated.

## IX. Conclusions

A refined chronic dietary (food and drinking water) exposure and risk assessment was performed for cyantraniliprole. The assumptions of this assessment were average residues for all crops, %CT where available, PCTn for some crops, % of grapes that are imported (wine), default DEEM 7.81 processing factors, and empirical processing factors. EDWCs from EFED were also included. The chronic dietary (food and drinking water) exposure estimates are below HED's level of concern (<100% cPAD) for the general U.S. population and all population subgroups. HED is confident that the assessment does not underestimate risk to the general U.S. population or any population subgroup.

## X. List of Attachments

1. Attachment 1. Chronic Food Plus Water Residue Input file.
2. Attachment 2. Chronic Results files: Food Plus Water
3. Attachment 3. Chronic Results files: Food Only
4. Attachment 4. Anticipated Residue Calculation for Risk Assessment
5. Attachment 5. Estimates of Percent Crop Treated for Registered Uses of Cyantraniliprole.

**Attachment 1. Chronic Food Plus Water Input File**

Filename: C:\Users\mnegussi\Documents\DEEM Version  
3.16\Cyantraniliprole\2016\Chronic\Final0607\ChronicCyantraniliproleMeanDairyCattle.  
R08

Chemical: Cyantraniliprole

RfD(Chronic): .01 mg/kg bw/day NOEL(Chronic): 1 mg/kg bw/day

RfD(Acute): 0 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day

Date created/last modified: 09-21-2016/10:49:30 Program ver. 3.16, 03-08-d

Comment: Average Residues-For all; EPA PCT; Empirical PF-potato flakes, orange  
juice, apple juice, tomato (paste, puree, juice), tomato dried, cotton seed oil,  
citrus oil, dried plum; water at 64 ppb; no juice, raisins, wine grape only; grape  
at 50%imported

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1 #2		Comment
9500016000	O	Artichoke, globe	0.031000	1.000	1.000	4F8258
9500112000	O	Coconut, dried	0.010000	2.100	1.000	
9500111000	O	Coconut, meat	0.010000	1.000	1.000	
9500111001	O	Coconut, meat-babyfood	0.010000	1.000	1.000	
9500113000	O	Coconut, milk	0.010000	1.000	1.000	
9500114000	O	Coconut, oil	0.010000	1.000	1.000	
9500116000	O	Coffee, instant	0.015000	1.000	1.000	4F8248
		Full comment: 4F8248				
9500115000	O	Coffee, roasted bean	0.015000	1.000	1.000	4F8248
		Full comment: 4F8248				
9500235000	O	Olive	0.390000	1.000	1.000	
9500236000	O	Olive, oil	0.390000	1.000	1.000	
9500263000	O	Peanut	0.010000	1.000	0.410	
9500264000	O	Peanut, butter	0.010000	1.890	0.410	
9500265000	O	Peanut, oil	0.010000	1.000	0.410	
9500289000	O	Pomegranate	0.010000	1.000	1.000	4F8258
9500372000	O	Tea, dried	13.040000	1.000	1.000	4F8258
9500373000	O	Tea, instant	13.040000	1.000	1.000	
0103015000	1CD	Arrowroot, flour	0.024000	1.000	1.000	DP# 40
		Full comment: DP# 407963				
0103015001	1CD	Arrowroot, flour-babyfood	0.024000	1.000	1.000	
0103017000	1CD	Artichoke, Jerusalem	0.024000	1.000	1.000	
0101050000	1AB	Beet, garden, roots	0.104000	1.000	1.000	
0101050001	1AB	Beet, garden, roots-babyfood	0.104000	1.000	1.000	
0101052000	1A	Beet, sugar	0.020000	1.000	0.400	
0101053000	1A	Beet, sugar, molasses	0.020000	1.000	0.400	
0101053001	1A	Beet, sugar, molasses-babyfood	0.020000	1.000	0.400	
0101052001	1A	Beet, sugar-babyfood	0.020000	1.000	0.400	
0101067000	1AB	Burdock	0.104000	1.000	1.000	
0101078000	1AB	Carrot	0.030000	1.000	0.230	
0101079000	1AB	Carrot, juice	0.030000	1.000	0.230	
0101078001	1AB	Carrot-babyfood	0.030000	1.000	0.230	
0103082000	1CD	Cassava	0.024000	1.000	1.000	
0103082001	1CD	Cassava-babyfood	0.024000	1.000	1.000	
0101084000	1AB	Celeriac	0.104000	1.000	1.000	
0101100000	1AB	Chicory, roots	0.030000	1.000	1.000	
0103139000	1CD	Dasheen, corm	0.024000	1.000	1.000	
0103166000	1CD	Ginger	0.024000	1.000	1.000	
0103167000	1CD	Ginger, dried	0.024000	1.000	1.000	
0103166001	1CD	Ginger-babyfood	0.024000	1.000	1.000	
0101168000	1AB	Ginseng, dried	0.030000	1.000	1.000	
0101190000	1AB	Horseradish	0.030000	1.000	1.000	
0101250000	1AB	Parsley, turnip rooted	0.030000	1.000	1.000	
0101251000	1AB	Parsnip	0.030000	1.000	1.000	
0101251001	1AB	Parsnip-babyfood	0.030000	1.000	1.000	
0103296000	1C	Potato, chips	0.025000	1.000	0.500	
0103297000	1C	Potato, dry (granules/ flakes)	0.025000	1.000	0.500	
0103297001	1C	Potato, dry (granules/ flakes)-b	0.025000	1.000	0.500	

0103298000	1C	Potato, flour	0.025000	1.000	0.500	
0103298001	1C	Potato, flour-babyfood	0.025000	1.000	0.500	
0103300000	1C	Potato, tuber, w/o peel	0.024000	1.000	0.500	
0103300001	1C	Potato, tuber, w/o peel-babyfood	0.024000	1.000	0.500	
0103299000	1C	Potato, tuber, w/peel	0.024000	1.000	0.500	
0103299001	1C	Potato, tuber, w/peel-babyfood	0.024000	1.000	0.500	
0101316000	1AB	Radish, Oriental, roots	0.104000	1.000	1.000	
0101314000	1AB	Radish, roots	0.104000	1.000	1.000	
0101327000	1AB	Rutabaga	0.025000	1.000	1.000	data f
Full comment: data for rutabaga						
0101331000	1AB	Salsify, roots	0.030000	1.000	1.000	
0103366000	1CD	Sweet potato	0.024000	1.000	1.000	
0103366001	1CD	Sweet potato-babyfood	0.024000	1.000	1.000	
0103371000	1CD	Tanier, corm	0.024000	1.000	1.000	
0103387000	1CD	Turmeric	0.024000	1.000	1.000	
0101388000	1AB	Turnip, roots	0.030000	1.000	1.000	
0103407000	1CD	Yam bean	0.024000	1.000	1.000	
0103406000	1CD	Yam, true	0.024000	1.000	1.000	
0200051000	2	Beet, garden, tops	8.025000	1.000	1.000	sugar
Full comment: sugar beet data						
0200101000	2	Chicory, tops	6.483000	1.000	1.000	turnip
Full comment: turnip data						
0200140000	2	Dasheen, leaves	6.483000	1.000	1.000	turnip
Full comment: turnip data						
0200317000	2	Radish, Oriental, tops	6.763000	1.000	1.000	
0200315000	2	Radish, tops	6.763000	1.000	1.000	radish
Full comment: radish data						
0200332000	2	Salsify, tops	8.025000	1.000	1.000	
0302103000	3B	Chive, fresh leaves	1.602000	1.000	1.000	DP# 40
Full comment: DP# 407963						
0301165000	3A	Garlic, bulb	0.015000	1.000	1.000	
0301165001	3A	Garlic, bulb-babyfood	0.015000	1.000	1.000	
0302198000	3B	Leek	1.602000	1.000	1.000	
0301237000	3A	Onion, bulb	0.015000	1.000	0.580	
0301238000	3A	Onion, bulb, dried	0.015000	9.000	0.580	
0301238001	3A	Onion, bulb, dried-babyfood	0.015000	9.000	0.580	
0301237001	3A	Onion, bulb-babyfood	0.015000	1.000	0.580	
0302239000	3B	Onion, green	1.602000	1.000	1.000	
0301338000	3A	Shallot, bulb	0.015000	1.000	1.000	
0302338500	3B	Shallot, fresh leaves	1.602000	1.000	1.000	
0401005000	4A	Amaranth, leafy	6.243000	1.000	1.000	DP# 40
Full comment: DP# 407963						
0401018000	4A	Arugula	6.243000	1.000	1.000	
0402076000	4B	Cardoon	2.783000	1.000	1.000	
0402085000	4B	Celery	2.783000	1.000	0.700	
0402086000	4B	Celery, juice	2.783000	1.000	0.700	
0402085001	4B	Celery-babyfood	2.783000	1.000	0.700	
0402087000	4B	Celtuce	2.783000	1.000	1.000	
0401104000	4A	Chrysanthemum, garland	6.243000	1.000	1.000	
0401133000	4A	Cress, garden	6.243000	1.000	1.000	
0401134000	4A	Cress, upland	6.243000	1.000	1.000	
0401138000	4A	Dandelion, leaves	6.243000	1.000	1.000	
0401150000	4A	Endive	6.243000	1.000	1.000	
0402152000	4B	Fennel, Florence	2.783000	1.000	1.000	
0401204000	4A	Lettuce, head	0.955000	1.000	0.780	
0401205000	4A	Lettuce, leaf	4.430000	1.000	0.780	
0401248000	4A	Parsley, leaves	6.243000	1.000	1.000	
0401313000	4A	Radicchio	0.955000	1.000	1.000	
0402322000	4B	Rhubarb	2.783000	1.000	1.000	
0401355000	4A	Spinach	6.243000	1.000	0.530	
0401355001	4A	Spinach-babyfood	6.243000	1.000	0.530	
0402367000	4B	Swiss chard	2.783000	1.000	1.000	
0501061000	5A	Broccoli	0.743000	1.000	0.810	DP# 40
Full comment: DP# 407963						
0502063000	5B	Broccoli raab	7.391000	1.000	1.000	
0501062000	5A	Broccoli, Chinese	0.743000	1.000	1.000	

0501061001	5A	Broccoli-babyfood	0.743000	1.000	0.810	
0501064000	5A	Brussels sprouts	0.556000	1.000	1.000	
0501069000	5A	Cabbage	0.556000	1.000	0.500	
0502070000	5B	Cabbage, Chinese, bok choy	7.391000	1.000	1.000	
0501072000	5A	Cabbage, Chinese, mustard	0.743000	1.000	1.000	
0501071000	5A	Cabbage, Chinese, napa	0.556000	1.000	1.000	
0501083000	5A	Cauliflower	0.743000	1.000	0.830	
0502117000	5B	Collards	7.391000	1.000	1.000	
0502194000	5B	Kale	7.391000	1.000	1.000	
0501196000	5A	Kohlrabi	0.556000	1.000	1.000	
0502229000	5B	Mustard greens	7.391000	1.000	1.000	
0502318000	5B	Rape greens	7.391000	1.000	1.000	
0502389000	5B	Turnip, greens	7.391000	1.000	1.000	
0603035000	6C	Bean, great northern, seed	0.034000	1.000	0.060	4F8258
0603030000	6C	Bean, black, seed	0.034000	1.000	0.060	
0603032000	6C	Bean, broad, seed	0.034000	1.000	0.060	
0602031000	6B	Bean, broad, succulent	0.017000	1.000	0.490	4F8258
0603034000	6C	Bean, cowpea, seed	0.034000	1.000	0.060	
0602033000	6B	Bean, cowpea, succulent	0.017000	1.000	0.490	4F8258
0603036000	6C	Bean, kidney, seed	0.034000	1.000	0.060	
0603038000	6C	Bean, lima, seed	0.034000	1.000	0.060	
0602037000	6B	Bean, lima, succulent	0.017000	1.000	0.490	4F8258
0603039000	6C	Bean, mung, seed	0.034000	1.000	0.060	
0603040000	6C	Bean, navy, seed	0.034000	1.000	0.060	
0603041000	6C	Bean, pink, seed	0.034000	1.000	0.060	
0603042000	6C	Bean, pinto, seed	0.034000	1.000	0.060	
0601043000	6A	Bean, snap, succulent	0.122000	1.000	0.490	4F8258
0601043001	6A	Bean, snap, succulent-babyfood	0.122000	1.000	0.490	4F8258
0603099000	6C	Chickpea, flour	0.134000	1.000	0.060	
0603098000	6C	Chickpea, seed	0.134000	1.000	0.060	
0603098001	6C	Chickpea, seed-babyfood	0.034000	1.000	0.060	
0603182000	6C	Guar, seed	0.034000	1.000	0.060	
0603182001	6C	Guar, seed-babyfood	0.034000	1.000	0.060	
0603203000	6C	Lentil, seed	0.134000	1.000	0.060	
0603256000	6C	Pea, dry	0.134000	1.000	0.060	4F8258
0603256001	6C	Pea, dry-babyfood	0.134000	1.000	0.060	
0601257000	6A	Pea, edible podded, succulent	0.619000	1.000	0.380	
0603258000	6C	Pea, pigeon, seed	0.134000	1.000	0.060	
0602259000	6B	Pea, pigeon, succulent	0.619000	1.000	0.380	
0602255000	6B	Pea, succulent	0.064000	1.000	0.380	
0602255001	6B	Pea, succulent-babyfood	0.064000	1.000	0.380	
0603348000	6C	Soybean, flour	0.066000	1.000	0.060	
0603348001	6C	Soybean, flour-babyfood	0.066000	1.000	0.060	
0600350000	6	Soybean, oil	0.066000	1.000	0.060	
0600350001	6	Soybean, oil-babyfood	0.066000	1.000	0.060	
0600347000	6	Soybean, seed	0.066000	1.000	0.060	
0600349000	6	Soybean, soy milk	0.066000	1.000	0.060	
0600349001	6	Soybean, soy milk-babyfood or in	0.066000	1.000	0.060	
0601349500	6AB	Soybean, vegetable	0.066000	1.000	0.490	
0802148000	8BC	Eggplant	0.127000	1.000	1.000	4F5258
Full comment: 4F5258 greenhouse use						
0802234000	8BC	Okra	0.127000	1.000	1.000	
0802270000	8B	Pepper, bell	0.127000	1.000	0.450	
0802271000	8B	Pepper, bell, dried	0.127000	1.000	0.450	
0802271001	8B	Pepper, bell, dried-babyfood	0.127000	1.000	0.450	
0802270001	8B	Pepper, bell-babyfood	0.127000	1.000	0.450	
0802272000	8BC	Pepper, nonbell	0.343000	1.000	0.450	
0802273000	8BC	Pepper, nonbell, dried	0.343000	1.000	0.450	
0802272001	8BC	Pepper, nonbell-babyfood	0.343000	1.000	0.450	
0801374000	8A	Tomatillo	0.239000	1.000	1.000	
0801375000	8A	Tomato	0.239000	1.000	0.540	
0801380000	8A	Tomato, Tree	0.239000	1.000	1.000	
0801378000	8A	Tomato, dried	0.864000	1.000	0.540	
0801378001	8A	Tomato, dried-babyfood	0.864000	1.000	0.540	
0801379000	8A	Tomato, juice	0.032000	1.000	0.540	

0801376000	8A	Tomato, paste	0.185000	1.000	0.540	
0801376001	8A	Tomato, paste-babyfood	0.185000	1.000	0.540	
0801377000	8A	Tomato, puree	0.058000	1.000	0.540	
0801377001	8A	Tomato, puree-babyfood	0.058000	1.000	0.540	
0801375001	8A	Tomato-babyfood	0.239000	1.000	0.540	
0902021000	9B	Balsam pear	0.155000	1.000	1.000	
0901075000	9A	Cantaloupe	0.110000	1.000	0.500	
0902088000	9B	Chayote, fruit	0.061000	1.000	1.000	
0902102000	9B	Chinese waxgourd	0.155000	1.000	1.000	
0902135000	9B	Cucumber	0.155000	1.000	0.230	4F8258
Full comment: 4F8258 greenhouse						
0901187000	9A	Honeydew melon	0.110000	1.000	1.000	
0902308000	9B	Pumpkin	0.061000	1.000	0.180	
0902309000	9B	Pumpkin, seed	0.061000	1.000	0.180	
0902356000	9B	Squash, summer	0.061000	1.000	0.240	
0902356001	9B	Squash, summer-babyfood	0.061000	1.000	0.240	
0902357000	9B	Squash, winter	0.061000	1.000	0.240	
0902357001	9B	Squash, winter-babyfood	0.061000	1.000	0.240	
0901399000	9A	Watermelon	0.110000	1.000	0.290	
0901400000	9A	Watermelon, juice	0.110000	1.000	0.290	
1001106000	10A	Citron	0.209000	1.000	1.000	DP# 40
Full comment: DP# 407963						
1001107000	10A	Citrus hybrids	0.209000	1.000	1.000	
1001108000	10A	Citrus, oil	1.371000	1.000	0.620	
1003180000	10C	Grapefruit	0.157000	1.000	0.870	
1003181000	10C	Grapefruit, juice	0.157000	2.100	0.870	
1002197000	10B	Kumquat	0.209000	1.000	1.000	
1002199000	10B	Lemon	0.198000	1.000	0.460	
1002200000	10B	Lemon, juice	0.198000	2.000	0.460	
1002200001	10B	Lemon, juice-babyfood	0.198000	2.000	0.460	
1002201000	10B	Lemon, peel	0.423000	1.000	0.460	
1002206000	10B	Lime	0.198000	1.000	0.460	
1002207000	10B	Lime, juice	0.198000	2.000	0.460	
1002207001	10B	Lime, juice-babyfood	0.198000	2.000	0.460	
1001240000	10A	Orange	0.209000	1.000	0.620	
1001241000	10A	Orange, juice	0.027000	1.000	0.620	
1001241001	10A	Orange, juice-babyfood	0.027000	1.000	0.620	
1001242000	10A	Orange, peel	0.473000	1.000	0.620	
1003307000	10C	Pummelo	0.157000	1.000	1.000	
1001369000	10A	Tangerine	0.209000	1.000	1.000	
1001370000	10A	Tangerine, juice	0.209000	2.300	1.000	
1100009000	11	Apple, dried	0.168000	8.000	0.610	DP# 40
Full comment: DP# 407963						
1100009001	11	Apple, dried-babyfood	0.168000	8.000	0.610	
1100007000	11	Apple, fruit with peel	0.168000	1.000	0.610	
1100010000	11	Apple, juice	0.064000	1.000	0.610	
1100010001	11	Apple, juice-babyfood	0.064000	1.000	0.610	
1100008000	11	Apple, peeled fruit	0.168000	1.000	0.610	
1100008001	11	Apple, peeled fruit-babyfood	0.168000	1.000	0.610	
1100011000	11	Apple, sauce	0.585000	1.000	0.610	
1100011001	11	Apple, sauce-babyfood	0.585000	1.000	0.610	
1100129000	11	Crabapple	0.168000	1.000	1.000	
1100173500	11	Goji berry	0.239000	1.000	1.000	
1100210000	11	Loquat	0.278000	1.000	1.000	
1100266000	11	Pear	0.278000	1.000	0.760	
1100267000	11	Pear, dried	0.278000	6.250	0.760	
1100268000	11	Pear, juice	0.278000	0.320	0.760	
1100268001	11	Pear, juice-babyfood	0.278000	0.320	0.760	
1100266001	11	Pear-babyfood	0.278000	1.000	0.760	
1100310000	11	Quince	0.278000	1.000	1.000	
1202012000	12B	Apricot	0.386000	1.000	0.530	DP# 40
Full comment: DP# 407963						
1202013000	12B	Apricot, dried	0.386000	6.000	0.530	
1202014000	12B	Apricot, juice	0.386000	1.000	0.530	
1202014001	12B	Apricot, juice-babyfood	0.386000	1.000	0.530	
1202012001	12B	Apricot-babyfood	0.386000	1.000	0.530	

1201090000	12A	Cherry	1.179000	1.000	0.480	
1201091000	12A	Cherry, juice	1.179000	1.500	0.480	
1201091001	12A	Cherry, juice-babyfood	1.179000	1.500	0.480	
1201090001	12A	Cherry-babyfood	1.179000	1.000	0.480	
1202230000	12B	Nectarine	0.386000	1.000	1.000	
1202260000	12B	Peach	0.386000	1.000	0.410	
1202261000	12B	Peach, dried	0.386000	7.000	0.410	
1202261001	12B	Peach, dried-babyfood	0.386000	7.000	0.410	
1202262000	12B	Peach, juice	0.386000	1.000	0.410	
1202262001	12B	Peach, juice-babyfood	0.386000	1.000	0.410	
1202260001	12B	Peach-babyfood	0.386000	1.000	0.410	
1203285000	12C	Plum	0.104000	1.000	0.590	
1203287000	12C	Plum, prune, dried	0.170000	1.000	0.590	
1203287001	12C	Plum, prune, dried-babyfood	0.170000	1.000	0.590	
1203286000	12C	Plum, prune, fresh	0.104000	1.000	0.590	
1203286001	12C	Plum, prune, fresh-babyfood	0.104000	1.000	0.590	
1203288000	12C	Plum, prune, juice	0.170000	1.400	0.590	
1203288001	12C	Plum, prune, juice-babyfood	0.170000	1.400	0.590	
1203285001	12C	Plum-babyfood	0.104000	1.000	0.590	
1302057000	13B	Blueberry	0.888000	1.000	0.450	DP# 40
Full comment: DP# 407963						
1302057001	13B	Blueberry-babyfood	0.888000	1.000	0.450	
1307130000	13G	Cranberry	0.022000	1.000	1.000	4F8258
1307131000	13G	Cranberry, dried	0.022000	1.000	1.000	
1307132000	13G	Cranberry, juice	0.022000	1.100	1.000	
1307132001	13G	Cranberry, juice-babyfood	0.022000	1.100	1.000	
1307130001	13G	Cranberry-babyfood	0.022000	1.000	1.000	
1302136000	13B	Currant	0.888000	1.000	1.000	
1302137000	13B	Currant, dried	0.888000	1.000	1.000	
1302149000	13B	Elderberry	0.888000	1.000	1.000	
1302174000	13B	Gooseberry	0.888000	1.000	1.000	
1304179000	13D	Grape, wine and sherry	0.291000	1.000	0.500	4F8258
Full comment: 4F8258						
1302191000	13B	Huckleberry	0.888000	1.000	1.000	
1307359000	13G	Strawberry	0.329000	1.000	0.590	
1307360000	13G	Strawberry, juice	0.329000	1.000	0.590	
1307360001	13G	Strawberry, juice-babyfood	0.329000	1.000	0.590	
1307359001	13G	Strawberry-babyfood	0.329000	1.000	0.590	
1400003000	14	Almond	0.013000	1.000	0.720	DP# 40
Full comment: DP# 407963						
1400004000	14	Almond, oil	0.013000	1.000	0.720	
1400004001	14	Almond, oil-babyfood	0.013000	1.000	0.720	
1400003001	14	Almond-babyfood	0.013000	1.000	0.720	
1400059000	14	Brazil nut	0.010000	1.000	1.000	
1400068000	14	Butternut	0.010000	1.000	1.000	
1400081000	14	Cashew	0.010000	1.000	1.000	
1400092000	14	Chestnut	0.013000	1.000	1.000	
1400155000	14	Hazelnut	0.010000	1.000	0.650	
1400156000	14	Hazelnut, oil	0.010000	1.000	0.650	
1400185000	14	Hickory nut	0.010000	1.000	1.000	
1400213000	14	Macadamia nut	0.010000	1.000	1.000	
1400269000	14	Pecan	0.010000	1.000	0.220	
1400278000	14	Pine nut	0.010000	1.000	1.000	
1400282000	14	Pistachio	0.013000	1.000	0.490	
1400391000	14	Walnut	0.010000	1.000	0.530	
1500122000	15	Corn, field, bran	0.010000	1.000	0.560	4F8258
1500120000	15	Corn, field, flour	0.010000	1.000	0.560	
1500120001	15	Corn, field, flour-babyfood	0.010000	1.000	0.560	
1500121000	15	Corn, field, meal	0.010000	1.000	0.560	
1500121001	15	Corn, field, meal-babyfood	0.010000	1.000	0.560	
1500125000	15	Corn, field, oil	0.010000	1.000	0.560	
1500125001	15	Corn, field, oil-babyfood	0.010000	1.000	0.560	
1500123000	15	Corn, field, starch	0.010000	1.000	0.560	
1500123001	15	Corn, field, starch-babyfood	0.010000	1.000	0.560	
1500124000	15	Corn, field, syrup	0.010000	1.000	0.560	
1500124001	15	Corn, field, syrup-babyfood	0.010000	1.000	0.560	

1500126000	15	Corn, pop	0.010000	1.000	0.560	
1500127000	15	Corn, sweet	0.010000	1.000	0.560	
1500127001	15	Corn, sweet-babyfood	0.010000	1.000	0.560	
1500326000	15	Rice, bran	0.010000	1.000	1.000	4F8258
1500326001	15	Rice, bran-babyfood	0.010000	1.000	1.000	
1500324000	15	Rice, brown	0.010000	1.000	1.000	
1500324001	15	Rice, brown-babyfood	0.010000	1.000	1.000	
1500325000	15	Rice, flour	0.010000	1.000	1.000	
1500325001	15	Rice, flour-babyfood	0.010000	1.000	1.000	
1500323000	15	Rice, white	0.010000	1.000	1.000	
1500323001	15	Rice, white-babyfood	0.010000	1.000	1.000	
2003114001	20C	Coconut, oil-babyfood	0.010000	1.000	1.000	DP# 40
Full comment: DP# 407963						
2003128000	20C	Cottonseed, oil	0.016000	1.000	0.410	
2003128001	20C	Cottonseed, oil-babyfood	0.016000	1.000	0.410	
2001163000	20A	Flax seed, oil	0.157000	1.000	1.000	
2001319000	20A	Rapeseed, oil	0.157000	1.000	0.150	
2001319001	20A	Rapeseed, oil-babyfood	0.157000	1.000	0.150	
2002330000	20B	Safflower, oil	0.142000	1.000	1.000	
2002330001	20B	Safflower, oil-babyfood	0.142000	1.000	1.000	
2001337000	20A	Sesame, oil	0.157000	1.000	1.000	
2001337001	20A	Sesame, oil-babyfood	0.157000	1.000	1.000	
2001336000	20A	Sesame, seed	0.157000	1.000	1.000	
2001336001	20A	Sesame, seed-babyfood	0.157000	1.000	1.000	
2002365000	20B	Sunflower, oil	0.142000	1.000	0.350	
2002365001	20B	Sunflower, oil-babyfood	0.142000	1.000	0.350	
2002364000	20B	Sunflower, seed	0.142000	1.000	0.350	4F8258
3100047000	31	Beef, fat	0.070000	1.000	1.000	
3100047001	31	Beef, fat-babyfood	0.070000	1.000	1.000	
3100048000	31	Beef, kidney	0.130000	1.000	1.000	
3100049000	31	Beef, liver	0.190000	1.000	1.000	
3100049001	31	Beef, liver-babyfood	0.190000	1.000	1.000	
3100044000	31	Beef, meat	0.020000	1.000	1.000	
3100046000	31	Beef, meat byproducts	0.190000	1.000	1.000	
3100046001	31	Beef, meat byproducts-babyfood	0.190000	1.000	1.000	
3100045000	31	Beef, meat, dried	0.020000	1.920	1.000	
3100044001	31	Beef, meat-babyfood	0.020000	1.000	1.000	
3200171000	32	Goat, fat	0.070000	1.000	1.000	
3200172000	32	Goat, kidney	0.130000	1.000	1.000	
3200173000	32	Goat, liver	0.190000	1.000	1.000	
3200169000	32	Goat, meat	0.020000	1.000	1.000	
3200170000	32	Goat, meat byproducts	0.190000	1.000	1.000	
3300189000	33	Horse, meat	0.020000	1.000	1.000	
3500341000	35	Sheep, fat	0.070000	1.000	1.000	
3500341001	35	Sheep, fat-babyfood	0.070000	1.000	1.000	
3500342000	35	Sheep, kidney	0.130000	1.000	1.000	
3500343000	35	Sheep, liver	0.190000	1.000	1.000	
3500339000	35	Sheep, meat	0.020000	1.000	1.000	
3500340000	35	Sheep, meat byproducts	0.190000	1.000	1.000	
3500339001	35	Sheep, meat-babyfood	0.020000	1.000	1.000	
3600222000	36	Milk, fat	0.120000	1.000	1.000	
3600222001	36	Milk, fat-baby food/infant formu	0.120000	1.000	1.000	
3600223000	36	Milk, nonfat solids	0.120000	1.000	1.000	
3600223001	36	Milk, nonfat solids-baby food/in	0.120000	1.000	1.000	
3600225001	36	Milk, sugar (lactose)-baby food/	0.120000	1.000	1.000	
3600224000	36	Milk, water	0.120000	1.000	1.000	
3600224001	36	Milk, water-babyfood/infant form	0.120000	1.000	1.000	
3800221000	38	Meat, game	0.030000	1.000	1.000	
3900312000	39	Rabbit, meat	0.030000	1.000	1.000	
8601000000	86A	Water, direct, all sources	0.064000	1.000	1.000	
8602000000	86B	Water, indirect, all sources	0.064000	1.000	1.000	

## Attachment 2. Chronic Food Plus Water Output File

U.S. EPA  
DEEM-FCID Chronic analysis for CYANTRANILIPROLE  
Residue file name: C:\Documents and Settings\MNEGUSSI\My Documents\DEEM Version 3.16\Cyantraniliprole\2016\Chronic\Final0607\ChronicCyantraniliproleMeanDairyCattle.R08

Ver. 3.16, 03-08-d

NHANES 2003-2008 2-day

Adjustment factor #2 used.

Analysis Date 09-21-2016/10:52:30 Residue file dated: 09-21-2016/10:49:30  
Reference dose (RfD, Chronic) = .01 mg/kg bw/day  
COMMENT 1: Average Residues-For all; EPA PCT; Empirical PF-potato flakes, orange juice, apple juice, tomato (paste, puree, juice), tomato dried, cotton seed oil, citrus oil, dried plum; water at 64 ppb; no juice, raisins, wine grape only; grape at 50%imported

### ----- Total exposure by population subgroup -----

Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
Total US Population	0.003423	34.2%
Hispanic	0.003328	33.3%
Non-Hisp-White	0.003440	34.4%
Non-Hisp-Black	0.003180	31.8%
Non-Hisp-Other	0.004026	40.3%
Nursing Infants	0.002966	29.7%
Non-Nursing Infants	0.008346	83.5%
Female 13+ PREG	0.002995	29.9%
Children 1-6	0.007509	75.1%
Children 7-12	0.003614	36.1%
Male 13-19	0.002440	24.4%
Female 13-19/NP	0.002474	24.7%
Male 20+	0.002769	27.7%
Female 20+/NP	0.003220	32.2%
Seniors 55+	0.003093	30.9%
All Infants	0.006685	66.8%
Female 13-50	0.002999	30.0%
Children 1-2	0.009776	97.8%
Children 3-5	0.006525	65.2%
Children 6-12	0.003898	39.0%
Youth 13-19	0.002455	24.5%
Adults 20-49	0.002917	29.2%
Adults 50-99	0.003126	31.3%
Female 13-49	0.002996	30.0%

**Attachment 3. Chronic Food Only Output File**

U.S. EPA  
DEEM-FCID Chronic analysis for CYANTRANILIPROLE  
Residue file name: C:\Documents and Settings\MNEGUSSI\My Documents\DEEM Version 3.16\Cyantraniliprole\2016\Chronic\Final0607\ChronicCyantraniliproleMeanDairyCattleFoodOnly.R08

Ver. 3.16, 03-08-d

NHANES 2003-2008 2-day

Adjustment factor #2 used.

Analysis Date 09-21-2016/10:55:11      Residue file dated: 09-21-2016/10:54:25  
Reference dose (RfD, Chronic) = .01 mg/kg bw/day  
COMMENT 1: Average Residues-For all; EPA PCT; Empirical PF-potato flakes, orange juice, apple juice, tomato (paste, puree, juice), tomato dried, cotton seed oil, citrus oil, dried plum; water at 64 ppb; no juice, raisins, wine grape only; grape at 50%imported

## =====

## Total exposure by population subgroup

Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
Total US Population	0.002083	20.8%
Hispanic	0.002048	20.5%
Non-Hisp-White	0.002062	20.6%
Non-Hisp-Black	0.002074	20.7%
Non-Hisp-Other	0.002482	24.8%
Nursing Infants	0.001753	17.5%
Non-Nursing Infants	0.003888	38.9%
Female 13+ PREG	0.001733	17.3%
Children 1-6	0.005793	57.9%
Children 7-12	0.002497	25.0%
Male 13-19	0.001518	15.2%
Female 13-19/NP	0.001441	14.4%
Male 20+	0.001520	15.2%
Female 20+/NP	0.001812	18.1%
Seniors 55+	0.001797	18.0%
All Infants	0.003229	32.3%
Female 13-50	0.001666	16.7%
Children 1-2	0.007843	78.4%
Children 3-5	0.004896	49.0%
Children 6-12	0.002723	27.2%
Youth 13-19	0.001477	14.8%
Adults 20-49	0.001580	15.8%
Adults 50-99	0.001804	18.0%
Female 13-49	0.001664	16.6%

**Attachment 4. Anticipated Residues for Risk Assessment.**

Dietary burdens were previously calculated for livestock (DP# D407961, S. Funk, 01/25/13): beef cattle - 0.37 ppm; dairy cattle - 0.42 ppm; poultry - 0.01; swine - 0.011 ppm. For chronic dietary assessment, dietary burdens were calculated based on feedstuffs associated with all proposed and registered, using PCT/PCTn where available and processing factors. The estimated dietary burdens are 0.15 ppm for beef cattle, 6.78 ppm for dairy cattle, 0.01 ppm for poultry, and 0.01 ppm for swine.

More Balanced Diet (MBD)							
Crop	Commodity	Type	Residue		%DM	%Diet	Dietary Contribution
			ppm	input			ppm
Beef Cattle							
Millet	Hay	R	0.14	Median	85	10	0.02
Barley	Hay	R	0.14	Median	88	5	0.008
Grain	Aspirated grain fractions	CC	1.93	Median	85	5	0.11
Beet, sugar	Molasses	CC	0.01	Median	75	10	0.001
Sorghum, grain	Grain	CC	0.01	Median	86	40	0.005
Barley	Grain	CC	0.01	Median	88	25	0.003
Soybean	Seed	PC	0.0069	Median	89	5	0.0004
Total	NA	NA	NA	NA	NA	100	0.15
Dairy Cattle							
Turnip	Tops	R	6.425	Median	30	30	6.43
Soybean	Hay	R	1.806	Median	85	15	0.32
Apples	Pomace, wet	CC	0.0964	Median	40	10	0.02
Beet, sugar	Molasses	CC	0.01	Median	75	10	0.001
Sorghum, grain	Grain	CC	0.01	Median	86	25	0.003
Cotton	Undelinted seed	PC	0.0656	Median	88	10	0.007
Total	NA	NA	NA	NA	NA	100	6.78
Poultry							
Barley	Grain	CC	0.01	Median	88	75	0.008
Soybean	Seed	PC	0.0069	Median	89	20	0.001
Cotton	Meal	PC	0.0066	Median	89	5	0.0003
Total	NA	NA	NA	NA	NA	100	0.009
Swine							
Barley	Grain	CC	0.01	Median	88	20	0.002
Millet	Grain	CC	0.01	Median	88	20	0.002
Rice	Bran	CC	0.01	Median	90	10	0.001
Rice	Grain	CC	0.01	Median	88	20	0.002
Sorghum, grain	Grain	CC	0.01	Median	86	15	0.002
Soybean	Seed	PC	0.0069	Median	89	15	0.001
Total	NA	NA	NA	NA	NA	100	0.01

<sup>1</sup> R: Roughage; CC: Carbohydrate concentrate; PC: Protein concentrate.

<sup>2</sup> OCSPP 860.1000 *Table 1 Feedstuffs* (June 2008).

<sup>3</sup> Contribution = ([expected residue /% DM] X % diet) for beef and dairy cattle; contribution = ([expected residue] X % diet) for swine and poultry.

Crop	Commodity	Residue Input	Processing Factor <sup>4</sup>	%Crop Treated	Evaluator Comment
Alfalfa	Forage	0.01	1	61%	Rotational
Alfalfa	Hay	0.01			Rotational
Alfalfa	Meal				
Alfalfa	Silage				
Almond	Hulls	1.6			
Apples	Pomace, wet	0.158			
Barley	Grain	0.01			Wheat data
Barley	Hay	0.14			Wheat data
Barley	Straw	0.043			Wheat data
Beet, sugar	Molasses	0.01	0.1	15%	Rotational
Beet, sugar	Pulp, dried				
Canola	Meal 1	0.102			
Carrot	Culls	0.03			23%
Citrus	Pulp, dried				
Clover	Forage	0.01			Rotational
Clover	Hay	0.01			Rotational
Clover	Silage				
Corn, field	Forage/Silage	0.01		56%	Seed Treatment
Corn, field	Grain	0.01		56%	Seed Treatment
Corn, field	Milled byproducts	0.01		56%	Seed Treatment
Corn, field	Stover	0.012		56%	Rotational
Corn, pop	Grain	0.01		56%	Rotational Field corn data)
Corn, pop	Stover	0.012		56%	Rotational Field corn data)
Corn, sweet	Cannery waste	0.01	0.1	41%	Rotational
Corn, sweet	Forage	0.01			Seed Treatment
Corn, sweet	Stover	0.01			Seed Treatment
Cotton	Gin byproducts	3.1			
Cotton	Hulls	0.16			
Cotton	Meal	0.16			
Cotton	Underlinted seed	0.16			
Cowpea	Forage	1.005		6%	Dry shelled beans
Cowpea	Hay	2.9		6%	Dry shelled beans
Cowpea	Seed	0.01		6%	Dry shelled beans
Crownvetch	Forage		193		
Fababeans	Seed				
Flax	Meal				
Grain	Aspirated grain fractions	0.01			
Grass	Forage	0.011			Rotational

Grass	Hay	0.024			Rotational
Grass	Silage				
Lespedeza	Forage				
Lespedeza	Hay				
Lupin	Seed				
Millet	Forage	0.044			Wheat data
Millet	Grain	0.01			Wheat data
Millet	Hay	0.14			Wheat data
Millet	Straw	0.043			
Oats	Forage	0.021			Rotational
Oats	Grain	0.01			Rotational
Oats	Hay	0.059			Rotational
Oats	Straw	0.022			Rotational
Oats					
Hulless	Grain				
Pea	Grain				
Pea	Straw				
Pea, field	Hay	7.425		6%	Primary Crop
Pea, field	Seed	0.049		6%	Primary Crop
Pea, field2	Silage				
Pea, field2	Vine	1.3		6%	Primary Crop
Peanut	Hay	0.64		41%	
Peanut	Meal				
Pineapple	Process residue				
Potato	Culls	0.014			
Potato	Process waste	0.014	0.6	50%	
Rape	Forage				
Rice	Bran	0.01			
Rice	Grain	0.01			
Rye	Forage	0.044			Wheat data
Rye	Grain	0.01			Wheat data
Rye	Straw	0.043			Wheat data
Safflower	Meal				
Sorghum	Forage	0.01			Rotational
Sorghum	Grain	0.01			Rotational
Sorghum	Stover	0.01			Rotational
Soybean3	Forage	2.925		21%	Primary Crop
Soybean3	Hay	8.6		21%	Primary Crop
Soybean	Hulls				
Soybean	Meal				
Soybean	Seed	0.033		21%	Primary Crop
Soybean3	Silage				
Sugarcane	Molasses				
Sunflower	Meal	0.1	0.1	35%	
Trefoil	Forage				
Trefoil	Hay				
Triticale	Grain	0.01			Wheat data
Turnip	Root				

Turnip	Tops	6.425			Primary Crop
Vetch	Forage				
Vetch	Hay				
Wheat	Forage	0.044			Rotational
Wheat	Grain	0.01			Rotational
Wheat	Hay	0.14			Rotational
Wheat	Milled byproducts	0.01			Rotational
Wheat	Straw	0.043			Rotational

### Expected secondary residues in meat and milk

The data indicate that quantifiable residues of cyantraniliprole occur in all cattle matrices (except in muscle at the lowest 3 ppm dose level) at all dosing levels. Quantifiable residues were also detected for some of the metabolites. Transfer factors for cyantraniliprole and metabolites were calculated for each matrix from the maximum residues of cyantraniliprole and its metabolites observed at the dose level closest to the RBDB in the dairy cattle feeding study. The maximum and (mean) residues and calculated transfer factors are presented in Tables 5 and 6. (DP# D407961, S. Funk, 01/25/2013).

<b>Table 5. Maximum (Mean) Residues of Cyantraniliprole in Cattle Commodities<sup>2</sup>.</b>						
Cattle Matrix	10.0 ppm					
	Cyan. (MW=473.7)	IN-J9Z38 (MW=491.7)	IN-MLA84 (MW=441.7)	IN-MYX98 (MW=489.7)	IN-N7B69 (MW=489.7)	Total Residues
Milk	0.11	<0.01	<0.01	<0.01	0.074	0.184
Muscle	0.037 (0.026)	<0.01	<0.01	<0.01	<0.01	0.037
Liver	0.16 (0.15)	<0.01	0.099 (0.075)	<0.01	0.024 (0.021)	0.283
Kidney	0.14 (0.084)	<0.01	0.017 (0.013)	<0.01	0.031 (0.031)	0.188
Fat <sup>2</sup>	0.066 (0.042)	0.031 (0.023)	<0.01	<0.01	<0.01	0.097

<sup>1</sup> Metabolites that are <0.01 were not included

<sup>2</sup> Includes omental, perirenal, and subcutaneous fat.

<b>Table 6. Maximum Anticipated Levels of Cyantraniliprole and Metabolites in Livestock Commodities Following Dosing at 1x the Dietary Burden.</b>				
Commodity	Transfer factors <sup>1</sup>	Estimated Dietary Burden <sup>2</sup>	Anticipated Residue	Recommended Anticipated Residue <sup>3</sup>
Milk	0.0184	6.78 <sup>2</sup>	0.125	0.12
Muscle	0.0037	6.78	0.025	0.02
Liver	0.0283	6.78	0.192	0.19
Kidney	0.0188	6.78	0.128	0.13
Fat <sup>1</sup>	0.0097	6.78	0.066	0.07

<sup>1</sup> Transfer factor calculated by dividing residue value by feeding level. For all tissues, the transfer factor was calculated using the maximum residue value observed at the specified feeding level.

<sup>2</sup> The estimated dietary burden for dairy cattle was used since this was the highest among the ruminants.

<sup>3</sup> The highest expected anticipated residue for liver (0.19 ppm) was used for meat byproducts of cattle, goat, horse, and sheep.

#### Expected secondary residues in poultry eggs and tissues

Residues of cyantraniliprole in eggs and tissues were below 0.1 ppm in all samples at the lowest dose group of 3 ppm (300X dietary burden). The parent compound was the major residue. Residue levels were dose dependent. Eggs seemed to contain the highest amount of residues, followed by liver, fat with skin and muscle. Transfer factors for cyantraniliprole and metabolites were calculated for each matrix from the maximum residues of cyantraniliprole and its metabolites observed at the dose level closest to the RBDB in the laying hen feeding study. Metabolite residues were not converted to parent equivalents since the molecular weights were close to the parent. The maximum and (mean) residues and calculated transfer factors are presented in Tables 7 and 8.

<b>Table 7. Maximum Residues of Cyantraniliprole and Metabolites in Poultry.</b>						
Cattle Matrix	3.0 ppm					
	Cyan. (MW=473.7)	IN-J9Z38 (MW=491.7)	IN-MLA84 (MW=441.7)	IN-MYX98 (MW=489.7)	IN-N7B69 (MW=489.7)	Total Residues
Eggs	0.082	0.039	0.016	0.014	0.01	0.161
Muscle	0.01	0.01	0.01	0.01	0.01	0.05
Liver	0.017	0.01	0.015	0.023	0.01	0.075
Skin with fat	0.01	0.01	0.01	0.01	0.01	0.05

<b>Table 8. Maximum Anticipated Levels of Cyantraniliprole and Metabolites in Poultry Commodities Following Dosing at 1x the Dietary Burden.</b>				
Commodity	Transfer Factors <sup>1</sup>	Estimated Dietary Burden <sup>2</sup>	Anticipated Residue	Recommended Tolerance
Eggs	0.0537	0.01	0.0005	None
Muscle	0.0167	0.01	0.0002	None
Liver	0.025	0.01	0.0002	None

**Table 8. Maximum Anticipated Levels of Cyantraniliprole and Metabolites in Poultry Commodities Following Dosing at 1x the Dietary Burden.**

Commodity	Transfer Factors <sup>1</sup>	Estimated Dietary Burden <sup>2</sup>	Anticipated Residue	Recommended Tolerance
Skin with fat	0.0167	0.01	0.0002	None

<sup>1</sup> Transfer factor calculated by dividing residue value by feeding level (3 ppm). For all tissues, the transfer factor was calculated using the maximum residue value observed at the specified feeding level.

<sup>2</sup> The estimated dietary burden for poultry was used.

Tolerances for swine, eggs, and poultry are not needed based on the conclusion that there is no reasonable expectation of finite residues in poultry commodities (a §180.6(a)(3) situation) (DP# D435591, M. Negussie, 08/15/2016).

### Processed Food and Feed

Previously, processing studies were reviewed for potato, spinach, tomatoes, oranges, apple, plums, and cottonseed. The data indicate that residues of cyantraniliprole and the metabolite (J9Z38) concentrated in sundried tomato, dry tomato pomace, orange oil, apple puree, dry apple pomace, applesauce, and dried plums. Metabolite IN-J9Z38 was included for dietary exposure analysis. A tolerance was recommended for residues in citrus oil at 2.4 ppm (DP# D407961, S. Funk, 01/25/2013).

Processing studies have been submitted for olives and grape wine. Tolerances are not needed for most processed commodities, as parent cyantraniliprole did not increase from the RAC to the processed commodity. Cyantraniliprole did concentrate in olive oil (2x) and wine (1.7x). The data indicate that residue of the metabolite (J9Z38) did not concentrate. Separate tolerances were recommended for residues in olive oil and wine at 2.0 ppm (DP# D435591, M. Negussie, 08/15/2016).

### Estimation of Anticipated Residues for the Processed Commodities

Crop field trial data were used to estimate anticipated residues for the processed commodities. Average cyantraniliprole and the metabolite (IN-J9Z38) residues in the RAC were multiplied by relevant processing factors to obtain the estimate of residues in the food as consumed. The result is combined and the total residue is used in the dietary assessment.

Anticipated Residue (AR) = Cyantraniliprole (Average Residue) x Median Processing Factor (PF) + IN-J9Z38 (Average Residue) x Median PF.

<b>Table 9. Summary of Processing Factors for Cyantraniliprole and IN-J9Z38.</b>			
RAC	Processed Commodity	Processing Factor (Median)	
		Cyantraniliprole	IN-J9Z38
Potato	Flakes	0.6	1
	Potato waste	0.6	1
	Peeled potato	0.6	1
	Chips	0.6	1
	Wet peel	0.9	4
	Culls	1	1
	Fries	0.6	1
	Unpeeled boiled	0.6	1
	Unpeeled microwaved	0.6	1
Spinach	Leaves, cooked	0.16	95
Tomato	Washed	0.18	1
	Peeled	0.08	1
	Sundried	3.5	2.7
	Canned	0.08	1
	Juice	0.09	1
	Wet pomace	0.65	1.7
	Dry pomace	1.8	3.5
	Paste	0.60	4.2
	Puree	0.19	1.3
Orange	Juice	0.08	1
	Wet Pulp	0.20	1
	Dry Pulp	0.38	1
	Meal	0.39	1
	Molasses	0.08	8.9
	Marmalade	0.08	1
	Oil	6.2	7.5
	Canned	0.077	1
Apple	Washed	0.57	1
	Puree	1.1	1
	Canned	0.12	1
	Frozen	0.95	1
	Juice	0.32	1
	Wet pomace	1	1
	Dry pomace	2.6	1.1
	Applesauce	1.4	35
Plum	Dried	1.5	1.4
Cotton seed	Oil (solvent ext)	0.03	1
	Refined oil (solvent ext)	0.006	1.5
	Meal (solvent ext)	0.04	1
	Hull	0.33	0.89
	Oil (cold press)	0.27	0.89

**Attachment 5. Estimates of Percent Crop Treated for Registered Uses of Cyantraniliprole (DP# 432594, D. Atwood, 09/01/2016).**

<b>Table 10. Estimates of Percent Crop Treated for Registered Uses of Cyantraniliprole.</b>				
Crop Group/Crop	Market Leader Chemical	Market Leader Year	Market Leader Average PCTn (chronic)	Market Leader Maximum PCTn (acute)
Citrus – oranges, grapefruit, and lemons	Abamectin	2012	64	67
	Abamectin	2013		
	Abamectin	2014		
Oranges	Abamectin	2012	62	67
	Abamectin	2013		
	Abamectin	2014		
Grapefruit	Abamectin	2012	87	88
	Abamectin	2013		
	Abamectin	2014		
Lemons	Spinetoram	2012	46	54
	Abamectin	2013		
	Abamectin	2014		
Pome Fruit – apples and pears	Abamectin	2012	51	54
	Chlorantraniliprole	2013		
	Spinetoram	2014		
Apples	Chlorpyrifos	2012	61	66
	Chlorpyrifos	2013		
	Chlorantraniliprole	2014		
Pears	Abamectin	2012	76	85
	Abamectin	2013		
	Abamectin	2014		
Stone Fruit – apricots, cherries, peaches, and plums/prunes	Esfenvalerate	2012	41	45
	Esfenvalerate	2013		
	Esfenvalerate	2014		
Apricots	Esfenvalerate	2012	53	71
	Esfenvalerate	2013		
	Esfenvalerate	2014		
Cherries	Spinosyn	2012	48	50
	Imidacloprid	2013		
	Imidacloprid	2014		
Peaches	Esfenvalerate	2012	41	43
	Esfenvalerate	2013		
	Esfenvalerate	2014		
Plums/Prunes	Esfenvalerate	2012	59	61
	Esfenvalerate	2013		
	Esfenvalerate	2014		
Tree Nuts – almonds, hazelnuts, pecans, pistachios, and walnuts	Abamectin	2012	25	26
	Abamectin	2013		
	Abamectin	2014		
Almonds	Abamectin	2012	72	76
	Abamectin	2013		
	Abamectin	2014		
Hazelnuts	Esfenvalerate	2012	65	73

**Table 10. Estimates of Percent Crop Treated for Registered Uses of Cyantraniliprole.**

Crop Group/Crop	Market Leader Chemical	Market Leader Year	Market Leader Average PCTn (chronic)	Market Leader Maximum PCTn (acute)
	Esfenvalerate	2013		
	Esfenvalerate	2014		
Pecans	Chlorpyrifos	2012	22	26
	Chlorpyrifos	2013		
	Chlorpyrifos	2014		
Pistachios	Permethrin	2012	49	53
	Bifenthrin/Permethrin	2013		
	Bifenthrin	2014		
Walnuts	Abamectin	2012	53	54
	Abamectin	2013		
	Abamectin	2014		
Bushberries – 13-07b* Blueberry	Phosmet	2009	45	62
	Phosmet	2011		
	Zeta-cypermethrin	2015		
Fruiting vegetables – peppers and tomatoes	Imidacloprid	2012	47	54
	Imidacloprid	2013		
	Imidacloprid	2014		
Peppers	Imidacloprid	2012	45	51
	Spinetoram	2013		
	Chlorantraniliprole	2014		
Tomatoes	Imidacloprid	2012	54	66
	Imidacloprid	2013		
	Imidacloprid	2014		
Cucurbits – cantaloupes, cucumbers, pumpkins, squash, and watermelons	Bifenthrin	2012	26	29
	Imidacloprid	2013		
	Bifenthrin	2014		
Cantaloupe	Bifenthrin	2012	50	56
	Imidacloprid	2013		
	Bifenthrin	2014		
Cucumbers	Bifenthrin	2012	23	28
	Chlorantraniliprole	2013		
	Bacillus thuringiensis	2014		
Pumpkins	Bifenthrin	2012	18	20
	Cyhalothrin-lambda	2013		
	Cyhalothrin-lambda	2014		
Squash	Imidacloprid	2012	24	30
	Imidacloprid	2013		
	Chlorantraniliprole	2014		
Watermelons	Imidacloprid	2012	29	36
	Imidacloprid	2013		
	Imidacloprid	2014		
Leafy vegetables – celery, lettuce, and spinach	Permethrin	2012	57	64
	Spinetoram	2013		

**Table 10. Estimates of Percent Crop Treated for Registered Uses of Cyantraniliprole.**

Crop Group/Crop	Market Leader Chemical	Market Leader Year	Market Leader Average PCTn (chronic)	Market Leader Maximum PCTn (acute)
	Spinetoram	2014		
Celery	Abamectin	2012	70	72
	Abamectin	2013		
	Abamectin	2014		
Lettuce	Imidacloprid	2012	78	84
	Imidacloprid	2013		
	Imidacloprid	2014		
Spinach	Permethrin	2012	53	61
	Spinetoram	2013		
	Spinetoram	2014		
Cole Crop – broccoli, cabbage, and cauliflower	Imidacloprid	2012	66	69
	Imidacloprid	2013		
	Imidacloprid	2014		
Broccoli	Imidacloprid	2012	81	87
	Imidacloprid	2013		
	Imidacloprid	2014		
Cabbage	Bifenthrin	2012	50	57
	Chlorantraniliprole	2013		
	Zeta-cypermethrin	2014		
Cauliflower	Imidacloprid	2012	83	88
	Imidacloprid	2013		
	Imidacloprid	2014		
Onion	Methomyl	2012	58	61
	Methomyl	2013		
	Methomyl	2014		
Potato	Imidacloprid	2012	50	55
	Imidacloprid	2013		
	Imidacloprid	2014		
Oilseeds – canola and sunflower	Cyhalothrin-lambda	2012	25	29
	Cyhalothrin-lambda	2013		
	Cyhalothrin-lambda	2014		
Canola	Cyhalothrin-lambda	2012	15	20
	Bifenthrin	2013		
	Cyhalothrin/Bifenthrin	2014		
Sunflower	Cyhalothrin-lambda	2012	35	41
	Cyhalothrin-lambda	2013		
	Cyhalothrin-lambda	2014		
Corn	Clothianidin	2012	56	59
	Clothianidin	2013		
	Clothianidin	2014		

Source(s): Market Survey Data 2012-2014 and\* USDA/NASS (2009, 2011, and 2015)

<b>Table 11. Percent Crop Treated Estimates for Proposed New Uses (PCTn) of Cyantraniliprole.</b>				
Crop Group/Crop	Market Leader Chemical	Market Leader Year	Market Leader Average PCTn (chronic)	Market Leader Maximum PCTn (acute)
Cotton	Thiamethoxam	2012	41	45
	Thiamethoxam	2013		
	Thiamethoxam	2014		
Peanuts	Phorate	2012	41	51
	Phorate	2013		
	Phorate	2014		
Tobacco	Acephate	2012	56	63
	Acephate	2013		
	Acephate	2014		
Root vegetables (Crop Group 1B) – Carrots	Esfenvalerate	2012	23	45
	Imidacloprid	2013		
	Esfenvalerate	2014		
Soybeans	Imidacloprid	2012	21	22
	Imidacloprid	2013		
	Thiamethoxam	2014		
Strawberries	Bifenthrin	2012	59	66
	Bifenthrin	2013		
	Bifenazate	2014		
Vegetable Crop Group 7 – Dry Beans/Peas, Soybeans, Beans (Snap, Bush, etc.), and Peas Fresh/Green/Sweet)	Imidacloprid	2012	20	22
	Imidacloprid	2013		
	Thiamethoxam	2014		
Dry Beans/Peas	Esfenvalerate	2012	6	7
	Cyhalothrin/dimet hoate	2013		
	Dimethoate	2014		
Soybeans	Imidacloprid	2012	21	22
	Imidacloprid	2013		
	Thiamethoxam	2014		
Beans (Snap, Bush, etc.)	Bifenthrin	2012	49	57
	Bifenthrin	2013		
	Bifenthrin	2014		
Peas (Fresh/Green/Sweet)	Bifenthrin	2012	38	48
	Bifenthrin	2013		
	Bifenthrin	2014		
Vegetable Crop Group 2 – Sugar beets and Carrots	Clothianidin	2012	40	45
	Imidacloprid	2013		
	Clothianidin	2014		
Sugar beets	Clothianidin	2012	40	45
	Clothianidin	2013		
	Clothianidin	2014		
Carrots	Esfenvalerate	2012	24	45
	Imidacloprid	2013		
	Esfenvalerate	2014		
Vegetable Crop Group 6A –	Imidacloprid	2012	21	22
	Imidacloprid	2013		

<b>Table 11. Percent Crop Treated Estimates for Proposed New Uses (PCTn) of Cyantraniliprole.</b>				
Crop Group/Crop	Market Leader Chemical	Market Leader Year	Market Leader Average PCTn (chronic)	Market Leader Maximum PCTn (acute)
Soybeans, Beans (Snap, Bush, etc., String), and Peas (Fresh/Green/Sweet)	Thiamethoxam	2014		
Soybeans	Imidacloprid	2012	21	22
	Imidacloprid	2013		
	Thiamethoxam	2014		
Beans (Snap, Bush, String, etc.)	Bifenthrin	2012	49	57
	Bifenthrin	2013		
	Bifenthrin	2014		
Peas (Fresh/Green/Sweet)	Bifenthrin	2012	38	48
	Bifenthrin	2013		
	Bifenthrin	2014		
Vegetable Crop Group 6C – Dried bean and peas	Esfenvalerate	2012	6	7
	Cyhalothrin-lambda	2013		
	Dimethoate	2014		

Source: Market Research Data 2012-2014.